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A Nordic work environment complement to Value Stream Mapping for sustainable patient flows at hospitals – A NOVO Multicenter study

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1. Background

The Nordic Council of Ministers (NCM) granted 2007-09 a project with the aim to establish and develop a Nordic Network for scientists ('the NOVO network') regarding research on work environment and efficiency in the health care sector. The vision is a "Nordic Model for sustainable systems" in health care. A "Sustainable system" is here defined as the joint consideration of competitive performance and working conditions in a long-term perspective (Westgaard & Winkel, 2009, 2011). A preliminary project plan for a Nordic Multicenter project focusing a specific aspect of the vision was developed as part of the above mentioned NCM project. This was entitled: "A Nordic work environment complement to Value Stream Mapping (VSM) for sustainable patient flows at hospitals – A NOVO Multicenter study".

Development of production systems in healthcare are at present to a large extent based on Lean Production ideas. In the Lean terminology "value-added work" (VAW) represents the portion of process time that employees spend on actions that create value as perceived by the customer (Liker 2004). The complementary part is "non-value-VAW" or "waste" as the general rationalization term. Rationalisations may involve changed demands on how

leadership is performed (Vest and Gamm 2009) and rearrangement of work procedures and work tasks, and often seem to imply work intensification through changed temporal exposure factors (Forsman *et al.* manuscript, Jonker *et al.* 2011, Kazmierczak *et al.* 2005, Ostensvik *et al.* 2008, Palmerud *et al.* pending revision). According to this, numerous case studies report a high prevalence of work-related complaints following rationalization initiatives (for references see Westgaard & Winkel 2011).

In healthcare Value-Stream Mapping (VSM) is a common Lean tool used to identify and minimize non-VAW (Keyte & Locher, 2004). It is a participatory tool, i.e. those affected by this type of rationalization are performing the analyses and thereafter suggest the interventions. Participation has been shown to be crucial to obtain ownership of the suggested interventions and thereby increase impact. In addition, VSM has been shown to be a powerful rationalization tool. However, the resulting interventions may imply physical work intensification and impaired psychosocial work environment if the proportion of VAW is increased and management issues are not properly considered (e.g. Jonker *et al.* 2011, Rolander *et al.* submitted, Westgaard & Winkel 2011). In the rationalization process both physical and psychosocial working conditions should therefore be integrated to obtain a competitive performance in a long term perspective (Westgaard & Winkel 2011). In practice, this is rarely done. Thus, health of the employees and system performance goals often end up on a collision course with short-term performance demands as the winner (e.g. Winkel & Westgaard 1996, Westgaard & Winkel 2011).

2. A Nordic Model for sustainable solutions

A management style based on dialog between the parties seems to be crucial in order to consider both competitive performance and health issues as part of the same intervention process (Westgaard & Winkel 2011). Due to this, we claim that the Nordic countries have special opportunities to develop sustainable production systems. This is based on the presence of "The Nordic model" which has regulated industrial relations in our part of the world (Guðmundsson 1993). It has evolved gradually over a period of over hundred years in the light of our special historical circumstances. The Nordic model has been the subject of extensive discussions and studies supported by the Nordic Council of Ministers (Schiller *et al.* 1993, Fleming *et al.* 1998, Fleming and Thörnqvist 2003).

The broader concept of "The Nordic model" is somewhat more difficult to define (Schiller *et al.* 1993), but includes "gentlemen's agreement" and trust between the parties. This is probably reflected in the selection and way of implementation of management strategies in the Nordic countries (Schramm-Nielsen *et al.* 2004). There is a large degree of "social capital" in the Nordic countries. This includes three cornerstones: teamwork, trust and justice. Recent studies show that Denmark, Norway, Sweden and Finland occupy leading positions 1-4 in the world regarding social capital (Tinggaard Svendsen & Lind Haase Svendsen 2006) and this may have played a key role in the impressive economic growth in these countries (Olesen *et al.* 2008).

3. Integration of change processes based on performance demands and health in a long-term perspective

During the period 2002-10 an ergonomic intervention process tool (ErgoVSM) was developed in a series of Swedish projects, based on existing scientific evidence and in close co-operation with Swedish industry and the healthcare sector. The aim was to facilitate simultaneous consideration of waste minimization and health issues (i.e. risk factors for musculoskeletal and mental health)(Jarebrant et al 2004, 2009). This requires a high degree of consensus between the parties and it is presumed that the Nordic countries with a common anchoring in "The Nordic model" offer the best prerequisite for this kind of research and practice. A prototype of ErgoVSM is now available (Jarebrant et al 2010a, b), but proper validation and further development are needed. As part of the NCM-funded NOVO project 2009, Sweden suggested that this could be performed within the healthcare sector as a Nordic Multicenter study. September 2011 NCM decided to grant our project plan, thus allowing a Nordic co-ordination of the national studies and initiatives in Denmark, Iceland, Norway and Sweden.

The present Nordic multicenter project adds to the national projects and initiatives by:

- strengthening the empirical basis in the evaluation and further development of the tool
- highlighting a practical example of the Nordic perspective on ergonomic (physical and mental) intervention research through a common Nordic scientific publication
- potentially increasing the practical use of the process instrument to more/all Nordic countries

By moving from a separate Swedish project to identical national studies in several countries extra demands are put on each project. The projects, each comprising several case and control patient flows, will be strictly co-ordinated into a Multicenter study to allow comparative analyses, further development of the tool and common conclusions.

The final delivery will be a common Nordic version of the process tool ErgoVSM comprising the work from survey to development and implementation of solutions. We aim to deliver two booklets: a guide and a workbook for intervention processes towards increased sustainability of patient flows based on our specific Nordic opportunities with a strong tradition of agreement between the parties (cf. 'the Nordic Model'). In addition, country-specific discrepancies may be revealed and then considered in the guide.

4. Financial support

- Nordic Council of Ministers
- National grants:
 - o Denmark: The Danish Working Environment Research Fund
 - o Iceland: University of Iceland, faculty grants. Additional applications are now sent to the Icelandic Nurse Association Research Fund, University of Iceland Research Fund and Research Fund for Graduate Students
 - o Norway: NTNU, faculty grant
 - o Sweden: AFA Insurance – research fund; Region Västra Götaland – R&D fund

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